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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/721,067	11/26/2003	Naoshi Matsuo	000538A	7810

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ARMSTRONG, KRATZ, QUINTOS, HANSON & BROOKS, LLP
1725 K STREET, NW
SUITE 1000
WASHINGTON, DC 20006

EXAMINER

PENDLETON, BRIAN T

ART UNIT

PAPER NUMBER

2644

DATE MAILED: 12/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/721,067	Applicant(s) MATSUO, NAOSHI	
	Examiner Brian T. Pendleton	Art Unit 2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 09/560,355.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 5, 9, and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Chu et al, US Patent 5,787,183. Chu discloses a microphone system for a teleconferencing system comprising microphones M_A , M_B , M_C , M_D with M_A directed to a positive direction on a first axis and microphones M_B , M_D directed to positive and negative directions on a second axis that is orthogonal to the first axis in figure 1. The received sound signal processing part for performing processing of the sound signals received from the plurality of microphones is found in figure 3. The processing section generates signals 330_{AC} and 330_{BD} which are used by the DSP 350 to generate a directional sound signal 390 based on the bi-directivity pattern expressed by either of the signals 330 along one axis and the unidirectivity pattern expressed by the microphones along the other axis. As taught in column 3 lines 17-26, the microphones are unidirectional microphones. The other sound signal processing function is a microphone selection process, as depicted in figure 5. The resulting directional sound signal is based on a unidirectional receive sound signal from a microphone and a bi-directional sound signal based on two microphones. Claim 1 is met. As to claim 5, interpreted in a different fashion, microphone M_A represents one unidirectional microphone and the combination of M_B and M_D represent a bi-directional microphone. The processing part calculates a directional signal based on the signal from M_A and

Art Unit: 2644

the signal 330_{BD} from the microphones M_B and M_D. Accompany method claims 9 and 10 are met.

Claims 1, 5, 9, and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Hatae, US Patent 5,675,655. Hatae discloses a sound input apparatus comprising microphone 1 on one axis, microphone 2 on the orthogonal axis, a signal processing part with variable amplifiers, 6, 8, subtractor 9, and adder 10 for estimating a directional sound signal to an arbitrary directional based on the unidirectivity pattern from microphone 1 and the bidirectivity pattern from microphone 2 (see figure 2). The microphones are unidirectional microphones with microphone 1 directed toward a positive direction on a first axis (if left is taken to be positive) and microphones 2 directed to positive and negative directions on a second axis. Signals from subtractor 9 or adder 10 are directional sound signals based on an unidirectional received sound and a bi-directional receive sound. The other sound signal processing function is performed by control circuit 17 which is used to minimize the error signal (or eliminate the signal picked up by microphone 2 out of the output from microphone 1). Claims 1 and 9 and met. As to claims 5 and 10, interpreted in a different manner, microphone 1 is an uni-directional microphone and microphones 2 taken together form a bi-directional microphone.

Claims 1, 5, 9, and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Huang et al, US Patent 6,173,059. Huang discloses a teleconferencing system comprising a plurality of unidirectional microphones A, B, C along three axes (see figure 1). An apparatus 900 (shown in figure 9) accomplishes signal mixing, selection of reception patterns and control of the audio output signal, as described in column 7 line 41 – column 8 line 65. The apparatus 900 is a sound signal processing part for estimating a directional sound signal in an arbitrary directional based

Art Unit: 2644

on the unidirectivity of a microphone along one axis and the bidirectivity pattern of a combination of the other microphones along another axis. (For instance figure 4 discloses a bidirectivity pattern from microphones A and B which can be combined with the uni-directional pattern from microphone C to form one of the directional sound signals used is beam selection unit 910.) The microphones are unidirectional microphones. The apparatus 900 forms a directional sound signal from the microphone signals and selects a beam, the other sound signal processing function. Claims 1 and 9 are met. As to claims 5 and 10, interpreted in a different fashion, microphones A and B represent a bi-directional microphone and microphone C represents an unidirectional microphone.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2-4 and 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chu or Huang in view of Chang et al, US Patent 6,469,732. Chu or Huang do not disclose a sound source direction detecting function for determining the direction of a sound source using a power in each axis direction of a sound signal calculated by the directional sound signal calculating function and a cross-correlation thereof. Chang et al disclose a microphone array for a video conference system that determines the position of a speaker using microphones 107L, 107R, 107C and 107R. As shown in figures 3 and 5 and taught in column 4 lines 20-62, sound signals

Art Unit: 2644

along axes are used to determine the location of a sound source by taking the power of the signals in each axis and doing a cross correlation. The benefit of this feature was to accurately determine the location of a conference participant and control the cameras 104L and 104R to point in his/her direction. Thus, it would have been obvious to one of ordinary skill in the art at the time of invention to incorporate the sound source determination method taught by Chang in either the Chu or Huang inventions to improve the teleconference effectiveness by quickly targeting a speaker. Claims 2 and 6 are met. As to claims 3 and 7, the sound enhancement processing to enhance the voice of the speaker involves steering a beam from the microphone signals in the direction of the speaker which is taught by Chu, Huang and Chang. It was obvious to do so in order that the speaker's speech is transmitted clearly to the remote parties. Regarding claims 4 and 8, Chang et al teaches the use of a movable camera, which was notoriously well known and implemented with the use of beamforming circuitry, such as that found in Chu and Chang, in the art of videoconferencing. It would have been obvious to one of ordinary skill in the art at the time of invention to use a movable camera to match the image of the speaker participant with his/her voice.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian T. Pendleton whose telephone number is (703) 305-9509. The examiner can normally be reached on M-F 7-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Forester W. Isen can be reached on (703) 305-4386. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2644

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Brian T. Pendleton
Examiner
Art Unit 2644

